

1. INTRODUCTION

The goal of this guidance document is to provide the best, most relevant information to State agencies, regional boards, local agencies, and nonpoint source (NPS) practitioners to assist them in identifying and implementing practices to protect high-quality waters and restore impaired waters. This guidance document is not applicable to any facilities that are considered point sources under the Clean Water Act, including confined animal facilities that are Concentrated Animal Feeding Operations (CAFOs) as defined by USEPA. The guidance is organized

The Management Measures Concept. Management measures establish performance expectations and, in many cases, describe actions that can be taken to prevent or minimize nonpoint source pollution or other negative impacts associated with uncontrolled and untreated runoff. Specific actions or practices for achieving the performance expectations are not included in the management measure statement. This is by design. Local officials and other practitioners need the flexibility to choose management practices that best achieve the management measure's performance expectations given their own unique circumstances. To aid in their decision, however, this guidance presents a selection of management practices that can be used to achieve each management measure.

around the six NPS categories identified in the *Plan for California's Nonpoint Source Pollution Control Program* of 2000: agriculture, forestry, urban areas, marinas and recreational boating, hydromodification, and wetlands/riparian areas/vegetated treatment systems. It supports the plan's goal of implementing the 61 NPS management measures by 2013. It also supports the implementation of NPS total maximum daily loads (TMDLs), as well as the development of TMDL implementation plans and watershed plans. A companion tool, the MP Miner, has been developed to allow users to identify and learn about potential management practices and their effectiveness to guide selection of appropriate management practices for different applications. The MP Miner can be found on the SWRCB Web site at <http://www.waterboards.ca.gov/nps/index.html>.

1.1 Regulatory Background

California's legal framework for implementing the NPS program is based on two primary federal laws—the Clean Water Act and Coastal Zone Management Act (CZMA)—and State and local law. In California, the Porter-Cologne Act is the principal State law governing water quality in California, and it provides the primary back-up authority to implement the NPS management measures. However, other State and local authorities are also critical components of the legal framework that address NPS pollution in California. In addition to the Porter-Cologne Act, this section describes the California Coastal Act, the California Environmental Quality Act (CEQA), and the California planning, zoning, and development laws. Additional details on these and other authorities that are part of this framework are identified in the *Plan for California's Nonpoint Source Pollution Control Program Volume II: California Management Measures for Polluted Runoff* (<http://www.swrcb.ca.gov/nps/cammpr.html>). Details on the State Water Resource Control Board's and California Coastal Commission's statutory authority for addressing nonpoint sources are included in Appendix B of the *Plan for California's Nonpoint Source Pollution Control Program Volume I: Nonpoint Source Program Strategy and Implementation Plan (1998-2013)*, entitled Legal Opinions (<http://www.swrcb.ca.gov/nps/docs/planvol1.doc>).

The *Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Implementation and Enforcement Policy) is designed to assist all responsible and/or interested parties in understanding how the State's NPS water quality control requirements will be implemented and enforced. The parties involved include the SWRCB and the Regional Water Quality Control Boards (RWQCBs); federal, state, and local agencies; individual dischargers; designated third party representatives; and any other interested public and private parties. More information about the NPS Implementation and Enforcement Policy can be found at the SWRCB Web site at <http://www.swrcb.ca.gov/nps/docs/oalfinalcopy052604.doc>.

1.1.1 Federal Laws

The Federal Water Pollution Control Act, known as the Clean Water Act (33 United States Code [USC] sections 1251 et seq.), is the principal federal statute for water quality protection. In California, the SWRCB and the nine RWQCBs implement many of the Clean Water Act's provisions. The Clean Water Act requires the State to adopt water quality standards and to submit those standards for approval by the U.S. Environmental Protection Agency (USEPA). For point source discharges to surface water, the Clean Water Act authorizes USEPA or approved states to administer the National Pollutant Discharge Elimination System (NPDES) program. Clean Water Act section 303(d) requires states to list surface waters not attaining (or not expected to attain) water quality standards after the application of technology-based effluent limits, and states normally must prepare and implement a TMDL for all waters on the Clean Water Act section 303(d) list. The Clean Water Act also establishes a loan program—the State Revolving Fund (SRF)—for the construction of water quality projects, including NPS projects.

In the 1987 Clean Water Act amendments, Congress added Clean Water Act section 319 (33 USC section 1329), which required states (1) to develop assessment reports that described the states' NPS problems, (2) to establish management programs to address these problems, and (3) to provide funding to support implementation of the programs. California's *Nonpoint Source Management Plan* (SWRCB, 1988) outlined a general approach to address persistent NPS problems using education and outreach, financial and technical assistance, and regulatory authorities when necessary. To enhance activities to address NPS pollution, states are currently encouraged to upgrade their NPS programs. In 1996, USEPA issued Clean Water Act section 319 program guidance that identified “nine key elements” that must be addressed to receive USEPA approval for upgraded NPS plans. Pursuant to the 1998 Clean Water Action Plan, states with upgraded NPS programs will receive increased funding based on a federal appropriation for state NPS programs above \$100 million. For California to receive additional funding in fiscal year 2000 and beyond, USEPA must certify that California's NPS Program has been upgraded consistent with the nine key elements.

The CZMA of 1972 (16 USC sections 1451 et seq.) established a national framework for effective management, protection, development, and beneficial use of the coastal zone. Pursuant to the CZMA, California prepared the California Coastal Management Program that was approved by the National Oceanic and Atmospheric Administration (NOAA). The bulk of California's coast is within the jurisdiction of the California Coastal Commission pursuant to the Coastal Act of 1976 (Public Resources Code [PRC] sections 30000 et seq.), while the San Francisco Bay Conservation and Development Commission has jurisdiction in San Francisco Bay pursuant to the McAteer-Petris Act (MPA) (Government Code sections 66600 et seq.). The State Coastal Conservancy is a third partner agency in the California Coastal Management Program.

Recognizing that the CZMA did not specifically mention water quality, in 1990 Congress amended CZMA section 306(d)(16) (16 USC section 1455[d][16]) and added section 6217 (16 USC section 1455b) to focus on NPS pollution problems and the protection of coastal waters. Coastal Zone Act Reauthorization Amendments (CZARA) section 6217 requires state coastal zone management agencies,

in coordination with state water quality agencies, to develop and implement management measures to restore and protect coastal waters from adverse impacts of NPS pollution. Similarly, CZMA section 306(d)(16)(16 USC section 1455[d][16]) requires that state coastal zone management programs contain enforceable policies and mechanisms to implement applicable requirements of CZARA section 6217. To achieve these goals, states were directed to coordinate and integrate their existing coastal zone management and water quality plans and programs, including the states' NPS management plans.

1.1.2 Porter-Cologne Water Quality Control Act

The Porter-Cologne Act is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and nonpoint sources of pollution. Pursuant to the Porter-Cologne Act (California Water Code section 13000 et seq.), the policy of the State is as follows:

- That the quality of all the waters of the State shall be protected,
- That all activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason, and
- That the State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation.

The Porter-Cologne Act established nine RWQCBs and the SWRCB, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. In addition, the SWRCB allocates rights to the use of surface water. The RWQCBs have primary responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. The SWRCB and RWQCBs have numerous NPS-related responsibilities, including problem monitoring and assessment, planning, financial assistance, and regulatory and non-regulatory management.

The RWQCBs regulate discharges under the Porter-Cologne Act primarily through issuance of NPDES permits for point source discharges and waste discharge requirements (WDRs) for NPS discharges. Anyone discharging or proposing to discharge materials that could affect water quality (other than to a community sanitary sewer system regulated by an NPDES permit) must file a report of waste discharge. The SWRCB and the RWQCBs can make their own investigations or may require dischargers to carry out water quality investigations and report on water quality issues. The Porter-Cologne Act provides several options for enforcing WDRs and other orders, including cease and desist orders, cleanup and abatement orders, administrative civil liability orders, civil court actions, and criminal prosecutions.

The Porter-Cologne Act also implements many provisions of the Clean Water Act, such as the NPDES permitting program. Section 401 of the Clean Water Act gives the SWRCB the authority to review any proposed federally permitted or federally licensed activity that may impact water quality and to certify, condition, or deny the activity if it does not comply with State water quality standards. If the SWRCB imposes a condition on its certification, those conditions must be included in the federal permit or license.

Except for dredge and fill activities, injection wells, and solid waste disposal sites, WDRs may not "specify the design, location, type of construction or particular manner in which compliance may be had" (Porter-Cologne Act section 13360). Thus, WDRs ordinarily specify the allowable discharge concentration or load or the resulting condition of the receiving water, rather than the manner by which

those results are to be achieved. However, the RWQCBs may impose discharge prohibitions and other limitations on the volume, characteristics, area, or timing of discharges and can set discharge limits such that the only practical way to comply is to use management practices. RWQCBs can also waive WDRs for a specific discharge or category of discharges on the condition that management measures identified in a water quality management plan approved by the SWRCB or RWQCB are followed.

The Porter-Cologne Act also requires adoption of water quality control plans that contain the guiding policies of water pollution management in California. A number of statewide water quality control plans have been adopted by the SWRCB. In addition, regional water quality control plans, commonly referred to as basin plans, have been adopted by each of the RWQCBs. All basin plans identify the existing and potential beneficial uses of waters of the State and establish water quality objectives to protect these uses. The basin plans also contain implementation, surveillance, and monitoring plans. Water quality control plans include enforceable prohibitions against certain types of discharges, including those that may pertain to nonpoint sources. Basin plans have been adopted for each of the nine regions.

Portions of water quality control plans are also subject to review by USEPA. When approved by USEPA, the water quality objectives and beneficial use designations become water quality standards under the Clean Water Act. In most cases, water quality objectives contained in a water quality control plan are not directly enforceable unless implemented through WDRs or water right permits.

1.1.3 California Coastal Act

The State Legislature enacted the California Coastal Act (PRC section 30000 et seq.) to provide for the conservation and planned development of the State's coastline. The Coastal Act mandates the protection and restoration of coastal waters pursuant to several sections in the PRC. Mandated activities include the following:

- To carry out a public education program to promote coastal conservation.
- To maintain, enhance, and, where feasible, restore marine resources.
- To maintain and, where feasible, restore biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes through, among other means, minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging wastewater reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.
- To protect against spillage of crude oil, gas, petroleum products, or hazardous wastes.
- To limit the alteration of wetlands, coastal waters, and estuaries and provide for feasible mitigation measures to minimize adverse environmental effects.
- To phase out or upgrade, where feasible, existing marine structures causing water stagnation contributing to pollution problems and fish kills.
- To limit hydromodification of rivers and streams. Channelization, dams, and other substantial alterations of rivers and streams must incorporate best mitigation measures feasible.

- To protect environmentally sensitive habitat areas (ESHAs). To site and design new development in areas adjacent to ESHAs to prevent significant adverse impacts.
- To protect long-term productivity of soils and timberlands.
- To site and design new development so as to not have significant adverse impacts either individually or cumulatively on coastal resources.
- To minimize alteration of natural landforms.
- To ensure that new development is stable, has structural integrity, and does not contribute significantly to erosion.
- To control impacts of dredging in specified port areas.
- To minimize harmful effects on coastal waters, including water quality, from fill within ports.
- To locate, design, and construct port-related development to minimize substantial environmental impacts and protect beneficial uses.

In carrying out the mandates of the Coastal Act, the California Coastal Commission (CCC) certifies local coastal programs (LCPs) prepared by local governments (PRC section 30500). The CCC also certifies plans prepared by port districts (PRC section 30711 et seq.), colleges and universities (PRC section 30605), and proponents of public works projects (PRC section 30605). In addition, the CCC approves coastal development permits (CDPs), energy projects, and federal (federally approved, conducted, or funded) projects consistent with Coastal Act policies. The Coastal Act also contains several means to deter and discipline violators of its provisions. To prevent imminent or further damage of coastal resources, the Executive Director of the SWRCB or the CCC can issue a cease and desist order to any party that is undertaking a development without a permit or in a manner inconsistent with the terms of a previously issued permit (PRC sections 30809 and 30810). The CCC can also order the restoration of a site (PRC section 30811). Civil liability fines for violations of the Coastal Act are specified in PRC sections 30820, 30821.6, and 30822. In practice, the CCC protects water quality primarily through (1) managing coastal development that generates runoff or creates spills, (2) assisting local coastal governments and other agencies to address land-use and development activities that may produce NPS pollution, and (3) implementing educational and technical assistance programs.

1.1.4 California Environmental Quality Act

California is one of 20 states with an environmental impact assessment law, called the California Environmental Quality Act (CEQA), which is modeled after the National Environmental Policy Act (NEPA). The SWRCB, RWQCBs, and all State and local government agencies must comply with CEQA. CEQA applies to discretionary activities proposed to be carried out by government agencies, including approval of permits and other entitlements. CEQA has six objectives:

1. To disclose to decision-makers and the public the significant environmental effects of proposed activities,
2. To identify ways to avoid or reduce environmental damage,

3. To prevent environmental damage by requiring implementation of feasible alternatives or mitigation measures,
4. To disclose to the public reasons for agency approvals of projects with significant environmental effects,
5. To foster interagency coordination, and
6. To enhance public participation.

CEQA sets forth procedural requirements to ensure that the objectives are accomplished and also contains substantive provisions requiring agencies to avoid or mitigate, when feasible, impacts disclosed in an Environmental Impact Report. In addition, CEQA sets forth a series of broad policy statements encouraging environmental protection. These policies have led the courts to interpret CEQA “so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language” (*Friends of Mammoth v. Board of Supervisors* [1972] 8 Cal 3d 247, 259, 104 Cal. Rptr. 761).

1.1.5 Planning, Zoning, and Development Laws

The legal framework within which California cities and counties exercise local planning and land use functions, which can play a critical role in addressing NPS pollution, is provided in the California Planning and Zoning Law (Government Code sections 65000 et seq.) and the Subdivision Map Act (SbMA) (Government Code sections 66410 et seq.), as well as in the Coastal Act.

Under State planning law, each city or county must adopt a comprehensive, long-term general plan for the physical development of the city or county and any land outside its jurisdiction that bears relation to its planning. Pursuant to Government Code section 65302, general plans must contain seven elements: (1) land use, (2) circulation, (3) housing, (4) conservation, (5) open space, (6) noise, and (7) safety. The following elements are the most relevant to NPS pollution prevention and control:

- Land Use. Designates categories such as housing, industry, and natural resources, including density and intensity of use.
- Conservation. Applies to conservation, development, and use of natural resources (e.g., soils, forests, rivers and other water bodies, and harbors). May also cover watershed protection, land or water reclamation, prevention or control of the pollution of streams and other coastal waters, regulation of land uses along stream channels and in other areas required to implement the conservation plan (e.g., buffer areas), to control or correct soil erosion, and for flood control.
- Open Space. Applies to the preservation of natural resources, including fish and wildlife habitat, rivers, streams, bays and estuaries, and open space.
- Circulation. Plans infrastructure, including water, sewage, and storm drainage.

While the general plan is a long-range look at the future of a community, a zoning ordinance spells out the immediate allowable uses for each property in the community. Each property in the community is assigned a “zone” listing the kinds of uses that will be allowed on that land (e.g., single family residential, multi-family residential, neighborhood commercial, light industrial, agricultural) and setting development standards (e.g., minimum lot size, maximum building height, minimum front-yard depth). The distribution of residential, commercial, industrial, and other zones is based on the pattern of land uses established in the community’s general plan. Zoning is adopted by ordinance and carries the weight of

local law. All local governments use some form of permitting process whereby a permit is issued for a specific project and can be conditioned based on compliance with the zoning ordinance.

Subdivision regulation, like zoning, is an exercise of police power and is a principal instrument for implementing a general plan. The SbMA (Government Code sections 66410 et seq.) sets forth other mandates that must be followed for subdivision processing.

The local government's corporate and police powers and zoning and subdivision ordinances are tools commonly used to implement general plans. Preferential assessment of real property can also offer landowners an economic incentive for keeping their land in agricultural, timber, or open space uses. This can serve to implement the land use, open space, and conservation elements of a general plan by reserving areas designated for agriculture, timber, open space, scenic resources, and natural resource use.

The Coastal Act also requires cities and counties that are located wholly or partially in the coastal zone to have an "eighth element" (the local coastal program or LCP) for that portion of the local government's jurisdiction in the coastal zone. When an LCP is certified by the CCC as being consistent with the goals and policies of the Coastal Act, coastal permit authority for that area is delegated to the local government. However, development in State tidelands, submerged lands, and public trust lands still requires a permit from the CCC, and certain types of local government decisions on coastal permits made under certified LCPs may be appealed to the CCC.

1.1.6 SWRCB Antidegradation Policy

A key policy of California's water quality program is the State's Antidegradation Policy. This policy, formally known as the *Statement of Policy with Respect to Maintaining High Quality Waters in California* (SWRCB Resolution No. 68-16), restricts degradation of surface and ground waters. In particular, this policy protects water bodies where existing quality is higher than necessary for the protection of beneficial uses.

Under the Antidegradation Policy, any actions that can adversely affect water quality in all surface and ground waters must (1) be consistent with maximum benefit to the people of the State, (2) not unreasonably affect present and anticipated beneficial use of the water, and (3) not result in water quality less than that prescribed in water quality plans and policies. Furthermore, any actions that can adversely affect surface waters are also subject to the Federal Antidegradation Policy (40 Code of Federal Regulations [CFR] section 131.12) developed under the Clean Water Act.

1.2 Structure of Document

The *California Nonpoint Source Encyclopedia* is designed to facilitate a general understanding of NPS management techniques and to provide quick access to essential information from a variety of sources. Direct links to Internet resources will enhance the usefulness of the guidance. The guidance is structured according to the 61 management measures so that the user can easily identify areas of interest, review the measures, and access additional information for selected topics. See Table 1-1 for a complete list of management measures by NPS category.

Fact sheets prepared for each of the 61 management measures provide a brief discussion of the essential elements and intent of each management measure and useful information sources and references. Each fact sheet contains the following sections:

- *Programs*: A description of several State and federal programs related to implementation of the management measure. For example, the fact sheets prepared for management measures related to urban runoff would include a discussion of the SWRCB and RWQCBs' NPDES storm water program, as well as the planning and land use permitting functions of other State agencies such as the California Coastal Commission.
- *Management Practices*: A list of specific practices that can be used to achieve the goals outlined in each management measure. This information includes a description of management practices or categories of practices and how they will contribute to meeting each management measure, as well as their applicability to situations in California and their cost-effectiveness in different climatic and land use settings. This information summarizes some of the best information from various documents and data sources, both national and state-specific.
- *Information Resources*: A list of some of the most useful "additional resources" such as Internet sites, technical reports, guidance manuals, and other references. These resources are intended to assist the user in understanding and implementing management practices to meet the management measure.
- *Case Studies*: Examples of successful implementation of the management measure or one or more management practices in California.
- *References*: Information resources that were used to compile the information contained in the fact sheet.

Table 1-1 provides a summary list of NPS categories and the California management measures that fall under each category.

Table 1-1. NPS Categories and Management Measures

NPS Category	Management Measures
Agriculture	1A Erosion and Sediment Control 1B Facility Wastewater and Runoff from Confined Animal Facilities 1C Nutrient Management 1D Pesticide Management 1E Grazing Management 1F Irrigation Water Management 1G Education and Outreach
Forestry	2A Preharvest Planning 2B Streamside Management Areas (SMAs) 2C Road Construction/Reconstruction 2D Road Management 2E Timber Harvesting 2F Site Preparation and Forest Regeneration 2G Fire Management 2H Revegetation of Disturbed Areas 2I Forest Chemical Management 2J Wetlands Forest Management 2K Postharvest Evaluation 2L Education/Outreach
Urban Areas	3.1 Runoff From Developing Areas 3.1A Watershed Protection 3.1B Site Development 3.1C New Development 3.2 Runoff from Construction Sites 3.2A Construction Site Erosion and Sediment Control 3.2B Construction Site Chemical Control 3.3 Runoff from Existing Development

NPS Category	Management Measures
	3.3A Existing Development 3.4 Runoff from Onsite Wastewater Treatment Systems (OWTSs) 3.4A New OWTSs 3.4B Operating OWTSs 3.5 Transportation Development (Roads, Highways, and Bridges) 3.5A Planning, Siting, and Developing Roads and Highways 3.5B Bridges 3.5C Construction Projects 3.5D Chemical Control 3.5E Operation and Maintenance 3.5F Road, Highway, and Bridge Runoff Systems 3.6 Education/Outreach 3.6A Pollution Prevention/Education: General Sources
Marinas and Recreational Boating	4.1 Assessment, Siting, and Design 4.1A Marina Flushing 4.1B Habitat Assessment 4.1C Water Quality Assessment 4.1D Shoreline Stabilization 4.1E Storm Water Runoff 4.1F Fueling Station Design 4.1G Sewage Facilities 4.1H Waste Management Facilities 4.2 Operation and Maintenance 4.2A Solid Waste Control 4.2B Fish Waste Control 4.2C Liquid Material Control 4.2D Petroleum Control 4.2E Boat Cleaning and Maintenance 4.2F Maintenance of Sewage Facilities 4.2G Boat Operation 4.3 Education/Outreach 4.3A Public Education/Outreach
Hydromodification	5.1 Channelization and Channel Modification 5.1A Physical and Chemical Characteristics of Surface Waters 5.1B Instream and Riparian Habitat Restoration 5.2 Dams 5.2A Erosion and Sediment Control 5.2B Chemical and Pollutant Control 5.2C Protection of Surface Water Quality and Instream and Riparian Habitat 5.3 Streambank and Shoreline Erosion 5.3A Eroding Streambanks and Shorelines 5.4 Education/Outreach 5.4A Educational Programs
Wetlands, Riparian Areas, and Vegetated Treatment Systems	6A Protection of Wetlands and Riparian Areas 6B Restoration of Wetlands and Riparian Areas 6C Vegetated Treatment Systems 6D Education/Outreach

1.2.1 References

- SWRCB. 1988. *Nonpoint Source Management Plan*. State Water Resources Control Board, Division of Water Quality, Sacramento, CA. November 1988.
- SWRCB. 2000. *Plan for California's Nonpoint Source Pollution Control Program*. Volume 1: Nonpoint Source Program Strategy and Implementation Plan (1998-2013) and Volume II: California's Management Measures for Polluted Runoff (CAMMPR). State Water Resources Control Board and the California Coastal Commission, Sacramento, CA.